

IN THE CLAIMS:

Please cancel Claims 11 to 19, 35 to 41, and 66 to 73 without prejudice or disclaimer of subject matter. Please amend the remaining claims, as follows:

1. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including a plurality of radiation points disposed with  
being spaced from each other in a main scanning direction; and  
deflecting means for deflecting a plurality of light beams radiated from said  
plurality of radiation points toward a surface to be scanned;  
wherein where a first radiation point is a radiation point for radiating the  
light beam, out of the plurality of light beams emitted from said plurality of radiation  
points, which reaches the farthest location from a center of a deflecting facet of said  
deflecting means in the main scanning direction, a second radiation point is a radiation  
point for radiating another light beam, and an upstream-side external angular range is a  
range which lies in an angular range over which the light beam can be deflected by said  
deflecting means, and which exists on an upstream side in a rotational direction of said  
deflecting means relative to an effective scanning angular range at the time when the light  
beam is deflected toward an effective scanning range on the surface to be scanned, control  
is performed such that the light beam from said second radiation point can be radiated prior  
to the light beam from said first radiation point in the upstream-side external angular range.

2. (Original) A multi-beam optical scanning apparatus according to claim 1, wherein the light beam of said radiation point for radiating the light beam reaching a location nearest a center of the deflecting facet of said deflecting means is radiated in the first place, out of the plurality of light beams radiated by said light source means.

3. (Original) A multi-beam optical scanning apparatus according to claim 2, wherein the light beam of said radiation point for radiating the light beam reaching a location nearer the center of the deflecting facet of said deflecting means is radiated in the order from the nearest location, out of the plurality of light beams radiated by said light source means.

4. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including a plurality of radiation points disposed with being spaced from each other in a main scanning direction; and  
deflecting means for deflecting a plurality of light beams radiated from said plurality of radiation points toward a surface to be scanned, the plurality of light beams radiated from said plurality of radiation points intersecting each other  $M$  times ( $M=2n+1$ ;  $n$  is an integer) between said light source means and said deflecting means;

wherein where a first radiation point is a radiation point disposed on a most upstream side in a rotational direction of said deflecting means, out of said plurality of radiation points, a second radiation point is a radiation point for radiating another light beam, and an upstream-side external angular range is a range which lies in an angular range

over which the light beam can be deflected by said deflecting means, and which exists on the upstream side in the rotational direction of said deflecting means relative to an effective scanning angular range at the time when the light beam is deflected toward an effective scanning range on the surface to be scanned, control is performed such that the light beam from said second radiation point can be radiated prior to the light beam from said first radiation point in the upstream-side external angular range.

5. (Original) A multi-beam optical scanning apparatus according to claim 4, wherein the light beam of said radiation point disposed on a most downstream side in the rotational direction of said deflecting means is radiated in the first place.

6. (Original) A multi-beam optical scanning apparatus according to claim 5, wherein the light beam of said radiation point disposed on the more downstream side in the rotational direction of said deflecting means is radiated in the order from the most downstream side.

7. (Original) A multi-beam optical scanning apparatus according to claim 4, wherein the radiation amount of the light beam is adjusted by radiating the light beam from said radiation point of said light source means in the upstream-side external angular range prior to the effective scanning range on the surface to be scanned.

8. (Original) A multi-beam optical scanning apparatus according to claim 4, further comprising a scanning optical system for forming images of the plurality of light beams deflected by said deflecting means on the surface to be scanned; and synchronous detecting means for detecting writing start timings on the surface to be scanned by receiving the plurality of light beams deflected by said deflecting means; and wherein synchronous detection is performed by radiating the light beam directed to said synchronous detecting means from said radiation point of said light source means in the upstream-side external angular range prior to the effective scanning range on the surface to be scanned.

9. (Original) A multi-beam optical scanning apparatus according to claim 4, wherein a chamfered portion is formed at an edge of a deflecting facet of said deflecting means.

10. (Original) A multi-beam optical scanning apparatus according to claim 4, wherein where a third radiation point is another radiation point other than said first radiation point disposed on the most upstream side in the rotational direction of said deflecting means, the light beam of said third radiation point is radiated in the first place in a downstream-side external angular range subsequent to the effective scanning range on the surface to be scanned.

11. to 41. (Cancelled)

20. (Previously Presented) A multi-beam optical scanning apparatus according to either of claims 1 or 4 wherein said light source means is comprised of a monolithic semiconductor laser.

21. (Previously Presented) Currently Amended) An image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in either of claims 1 or 4;

an image bearing member placed at the surface to be scanned;

developing means for developing an electrostatic latent image, which is formed on said image bearing member by the light beam scanned by said multi-beam optical scanning apparatus, as a toner image;

transferring means for transferring the developed toner image onto a transferring material; and

fixing means for fixing the transferred toner image on the transferring material.

22. (Original) An image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in claim 21; and

a printer controller for converting code data input from an external apparatus into an image signal to supply the image signal to said multi-beam optical scanning apparatus.

23. (Previously Presented) A color image forming apparatus comprising:  
a plurality of multi-beam optical scanning apparatuses each of which  
includes a multi-beam optical scanning apparatus recited in either of claims 1 or 4; and  
a plurality of image bearing members each of which is placed at the surface  
to be scanned of said each multi-beam optical scanning apparatus, and which form images  
of different colors, respectively.

24. (Original) A color image forming apparatus comprising:  
a multi-beam optical scanning apparatus recited in claim 23; and  
a printer controller for converting code data input from an external  
apparatus into an image signal to supply the image signal to said multi-beam optical  
scanning apparatus.

25. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including at least three radiation points disposed with  
being spaced from each other in a main scanning direction; and  
deflecting means for deflecting at least three light beams radiated from said  
at least three radiation points toward a surface to be scanned;  
wherein where a first radiation point is a radiation point for radiating the  
light beam, out of the at least three light beams emitted from said at least three radiation  
points, which reaches the farthest location from a center of a deflecting facet of said  
deflecting means in the main scanning direction, a second radiation point is a radiation

point for radiating another light beam, and an upstream-side external angular range is a range which lies in an angular range over which the light beam can be deflected by said deflecting means, and which exists on an upstream side in a rotational direction of said deflecting means relative to an effective scanning angular range at the time when the light beam is deflected toward an effective scanning range on the surface to be scanned, control is performed such that the light beam from said second radiation point can be radiated prior to the light beam from said first radiation point in the upstream-side external angular range.

26. (Original) A multi-beam optical scanning apparatus according to claim 25, wherein the light beam of said radiation point for radiating the light beam reaching a location nearest a center of the deflecting facet of said deflecting means is radiated in the first place, out of the at least three light beams radiated by said light source means.

27. (Original) A multi-beam optical scanning apparatus according to claim 26, wherein the light beam of said radiation point for radiating the light beam reaching a location nearer the center of the deflecting facet of said deflecting means is radiated in the order from the nearest location, out of the at least three light beams radiated by said light source means.

28. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including at least three radiation points disposed with  
being spaced from each other in a main scanning direction; and

deflecting means for deflecting at least three light beams radiated from said at least three radiation points toward a surface to be scanned, the at least three light beams radiated from said at least three radiation points intersecting each other  $M$  times ( $M=2n+1$ ;  $n$  is an integer) between said light source means and said deflecting means;

wherein where a first radiation point is a radiation point disposed on a most upstream side in a rotational direction of said deflecting means, out of said at least three radiation points, a second radiation point is a radiation point for radiating another light beam, and an upstream-side external angular range is a range which lies in an angular range over which the light beam can be deflected by said deflecting means, and which exists on the upstream side in the rotational direction of said deflecting means relative to an effective scanning angular range at the time when the light beam is deflected toward an effective scanning range on the surface to be scanned, control is performed such that the light beam from said second radiation point can be radiated prior to the light beam from said first radiation point in the upstream-side external angular range.

29. (Original) A multi-beam optical scanning apparatus according to claim 28, wherein the light beam of said radiation point disposed on a most downstream side in the rotational direction of said deflecting means is radiated in the first place.

30. (Original) A multi-beam optical scanning apparatus according to claim 29, wherein the light beam of said radiation point disposed on the more downstream side in



the rotational direction of said deflecting means is radiated in the order from the most downstream side.

31. (Original) A multi-beam optical scanning apparatus according to claim 28, wherein the radiation amount of the light beam is adjusted by radiating the light beam from said radiation point of said light source means in the upstream-side external angular range prior to the effective scanning range on the surface to be scanned.

32. (Original) A multi-beam optical scanning apparatus according to claim 28, further comprising a scanning optical system for forming images of the at least light beams deflected by said deflecting means on the surface to be scanned; and synchronous detecting means for detecting writing start timings on the surface to be scanned by receiving the at least three light beams deflected by said deflecting means; and wherein synchronous detection is performed by radiating the light beam directed to said synchronous detecting means from said radiation point of said light source means in the upstream-side external angular range prior to the effective scanning range on the surface to be scanned.

33. (Original) A multi-beam optical scanning apparatus according to claim 28, wherein a chamfered portion is formed at an edge of a deflecting facet of said deflecting means.

34. (Original) A multi-beam optical scanning apparatus according to claim 28, wherein where a third radiation point is another radiation point other than said first radiation point disposed on the most upstream side in the rotational direction of said deflecting means, the light beam of said third radiation point is radiated in the first place in a downstream-side external angular range subsequent to the effective scanning range on the surface to be scanned.

35. to 41. (Cancelled)

42. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including at least three radiation points disposed with  
being spaced from each other in a main scanning direction; and  
deflecting means for deflecting at least three light beams radiated from said  
at least three radiation points toward a surface to be scanned;  
wherein the light beam of said radiation point for radiating the light beam  
firstly incident on a deflecting facet of said deflecting means in the main scanning direction  
is radiated prior to the light beam from the other radiation point.

43. (Original) A multi-beam optical scanning apparatus according to claim 42, further comprising a scanning optical system for forming images of the at least three light beams deflected by said deflecting means on the surface to be scanned; and  
synchronous detecting means for detecting writing start timings on the surface to be

scanned by receiving the at least three light beams deflected by said deflecting means; and wherein synchronous detection is performed by radiating the light beam directed to said synchronous detecting means from said radiation point of said light source means in the upstream-side external angular range prior to the effective scanning range on the surface to be scanned.

44. (Previously Presented) A multi-beam optical scanning apparatus according to either of claims 25 or 28, wherein said light source means is comprised of a monolithic semiconductor laser.

45. (Previously Presented) An image forming apparatus comprising:  
a multi-beam optical scanning apparatus recited in either of claims 25 or 28;  
an image bearing member placed at the surface to be scanned;  
developing means for developing an electrostatic latent image, which is formed on said image bearing member by the light beam scanned by said multi-beam optical scanning apparatus, as a toner image;  
transferring means for transferring the developed toner image onto a transferring material; and  
fixing means for fixing the transferred toner image on the transferring material.

46. (Original) An image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in claim 45; and  
a printer controller for converting code data input from an external  
apparatus into an image signal to supply the image signal to said multi-beam optical  
scanning apparatus.

47. (Previously Presented) A color image forming apparatus comprising:  
a plurality of multi-beam optical scanning apparatuses each of which  
includes a multi-beam optical scanning apparatus recited in either of claims 25 or 28; and  
a plurality of image bearing members each of which is placed at the surface  
to be scanned of said each multi-beam optical scanning apparatus, and which form images  
of different colors, respectively.

48. (Original) A color image forming apparatus comprising:  
a multi-beam optical scanning apparatus recited in claim 47; and  
a printer controller for converting code data input from an external  
apparatus into an image signal to supply the image signal to said multi-beam optical  
scanning apparatus.

49. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including a plurality of radiation points disposed with  
being spaced from each other in a main scanning direction; and

deflecting means for deflecting a plurality of light beams radiated from said plurality of radiation points toward a surface to be scanned;

wherein where a first radiation point is a radiation point for radiating the light beam, out of the plurality of light beams emitted from said plurality of radiation points, which reaches the farthest location from a center of a deflecting facet of said deflecting means in the main scanning direction, a second radiation point is a radiation point for radiating another light beam, and an upstream-side external angular range is a range which lies in an angular range over which the light beam can be deflected by said deflecting means, and which exists on an upstream side in a rotational direction of said deflecting means relative to an effective scanning angular range at the time when the light beam is deflected toward an effective scanning range on the surface to be scanned, a width of the deflecting facet in a main scanning section is set to such a magnitude that the light beam reaching the location most spaced from the center of the deflecting facet at an end portion of the deflecting facet is eclipsed in the event that the light beam from said first radiation point for radiating the light beam reaching the location most spaced from the center of the deflecting facet is radiated prior to the light beam from said second radiation point in the upstream-side external angular range, and control is performed such that the light beam from said second radiation point can be radiated prior to the light beam from said first radiation point in the upstream-side external angular range.

50. (Original) A multi-beam optical scanning apparatus comprising:

light source means including a plurality of radiation points disposed with being spaced from each other in a main scanning direction; and

deflecting means for deflecting a plurality of light beams radiated from said plurality of radiation points toward a surface to be scanned;

wherein a width of the deflecting facet in a main scanning section is set to such a magnitude that the light beam last incident on an end portion of the deflecting facet is eclipsed in the event that the light beam from said radiation point for radiating the light beam last incident on the deflecting facet of said deflecting means is radiated prior to the light beam from the other radiation point, and the light beam of said radiation point for radiating the light beam firstly incident on the deflecting facet of said deflecting means in the main scanning direction is radiated prior to the light beam from the other radiation point.

51. (Original) A multi-beam optical scanning apparatus comprising:

light source means including at least three radiation points disposed with being spaced from each other in a main scanning direction; and

deflecting means for deflecting at least three light beams radiated from said at least three radiation points toward a surface to be scanned;

wherein where a first radiation point is a radiation point for radiating the light beam, out of the at least three light beams emitted from said at least three radiation points, which reaches the farthest location from a center of a deflecting facet of said deflecting means in the main scanning direction, a second radiation point is a radiation

point for radiating another light beam, and an upstream-side external angular range is a range which lies in an angular range over which the light beam can be deflected by said deflecting means, and which exists on an upstream side in a rotational direction of said deflecting means relative to an effective scanning angular range at the time when the light beam is deflected toward an effective scanning range on the surface to be scanned, a width of the deflecting facet in a main scanning section is set to such a magnitude that the light beam reaching the farthest location from a center of the deflecting facet at an end portion of the deflecting facet is eclipsed in the event that the light beam from said first radiation point for radiating the light beam reaching the location most spaced from the center of the deflecting facet is radiated prior to the light beam from said second radiation point in the upstream-side external angular range, and control is performed such that the light beam from said second radiation point can be radiated prior to the light beam from said first radiation point in the upstream-side external angular range.

52. (Original) A multi-beam optical scanning apparatus comprising:  
light source means including at least three radiation points disposed with  
being spaced from each other in a main scanning direction; and  
deflecting means for deflecting at least three light beams radiated from said  
at least three radiation points toward a surface to be scanned;  
wherein a width of a deflecting facet of said deflecting means in a main  
scanning section is set to such a magnitude that the light beam last reaching an end portion  
of the deflecting facet is eclipsed in the event that the light beam from said radiation point

for radiating the light beam last incident on the deflecting facet of said deflecting means is radiated prior to the light beam from the other radiation point, and the light beam from said radiation point for radiating the light beam firstly incident on the deflecting facet of said deflecting means in the main scanning direction is radiated prior to the light beam from the other radiation point.

53. (Original) An image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in any one of claims 49 to 52;

an image bearing member placed at the surface to be scanned;

developing means for developing an electrostatic latent image, which is formed on said image bearing member by the light beam scanned by said multi-beam optical scanning apparatus, as a toner image;

transferring means for transferring the developed toner image onto a transferring material; and

fixing means for fixing the transferred toner image on the transferring material.

54. (Original) An image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in claim 53; and



a printer controller for converting code data input from an external apparatus into an image signal to supply the image signal to said multi-beam optical scanning apparatus.

55. (Original) A color image forming apparatus comprising:

a plurality of multi-beam optical scanning apparatuses each of which includes a multi-beam optical scanning apparatus recited in any one of claims 49 to 52; and  
a plurality of image bearing members each of which is placed at the surface to be scanned of said each multi-beam optical scanning apparatus, and which form images of different colors, respectively.

56. (Original) A color image forming apparatus comprising:

a multi-beam optical scanning apparatus recited in claim 55; and  
a printer controller for converting code data input from an external apparatus into an image signal to supply the image signal to said multi-beam optical scanning apparatus.

57. (Currently Amended) A multi-beam optical scanning apparatus comprising:

light source means including a plurality of radiation points spaced from each other in a main scanning direction and in a sub-scanning direction;

a rotational polygon mirror for deflecting a plurality of light beams radiated from the plurality of radiation points toward a surface to be scanned ~~which is scanned with the plurality of light beams;~~

an imaging optical system for imaging the plurality of light beams deflected for scanning by a deflecting facet of the rotational polygon mirror on the surface to be scanned; and

synchronous detecting means for detecting the plurality of light beams deflected for scanning by the deflecting facet of the rotational polygon mirror so as to output a synchronous signal to determine a scanning start position of the plurality of light beams within an effective scanning range on the surface to be scanned in the main scanning direction,

wherein synchronous detection in which the synchronous detecting means detects the plurality of light beams is performed prior to that an image is recorded on the surface to be scanned within the effective scanning range by the plurality of light beams, and

wherein letting a first radiation point be a radiation point for radiating a light beam which reaches the farthest location from a center of the deflecting facet of the rotational polygon mirror in the main scanning section and letting a second radiation point be a radiation point for radiating another light beam out of the plurality of light beams emitted from the plurality of radiation points when the synchronous detection, the deflecting facet of the rotational polygon mirror has a width in a main scanning section in which a light beam reaching the farthest location from a center of the deflecting facet is

eclipsed by an edge portion of the deflection facet if a light beam from the first radiation point which radiates a light beam reaching the farthest location from the center of the deflecting facet is ~~emitted~~ radiated prior to a light beam from the second radiation point when the synchronous detection, and further control is performed such that the light beam from the second radiation point is radiated prior to the light beam from the first radiation point when the synchronous detection.

58. (Previously Presented) A multi-beam optical scanning apparatus according to claim 57, wherein said light beam from said radiation point which radiates a light beam reaching a location nearest a center of said deflecting facet of said rotational polygon mirror in the main scanning section is radiated in the first place, out of said plurality of light beams radiated by said light source means when said synchronous detection.

59. (Previously Presented) A multi-beam optical scanning apparatus according to claim 57, wherein light beams from said radiation points are radiated in order from a light beam from the radiation point which radiates a light beam reaching a location nearer the center of said deflecting facet of said rotational polygon mirror in the main scanning section, out of said plurality of light beams radiated by said light source means when said synchronous detection.

60. (Previously Presented) A multi-beam optical scanning apparatus according to claim 57, further comprising a synchronous detection optical system for imaging said plurality of light beams deflected for scanning by said deflection facet of said rotational polygon mirror in said synchronous detection means,

wherein the plurality of light beams deflected for scanning by the deflection facet of the rotational polygon mirror enter the synchronous detection means without passing through said imaging optical system.

61. (Previously Presented) An image forming apparatus comprising:  
a multi-beam optical scanning apparatus according to claim 57;  
an image bearing member placed at said surface to be scanned;  
developing means for developing an electrostatic latent image formed on said image bearing member by the light beam with which the multi-beam optical scanning apparatus scans, as a toner image;

transferring means for transferring a developed toner image onto a transferring material; and

fixing means for fixing the transferred toner image on the transferring material.

62. (Previously Presented) An image forming apparatus comprising:  
a multi-beam optical scanning apparatus according to claim 57; and

a printer controller for converting code data input from an external device into an image signal to input the image signal to the multi-beam optical scanning apparatus.

63. (Currently Amended) A multi-beam optical scanning apparatus comprising:

light source means including a plurality of radiation points disposed spaced from each other in a main scanning direction and in a sub-scanning direction;

a rotational polygon mirror for deflecting a plurality of light beams radiated from the plurality of radiation points toward a surface to be scanned ~~which is scanned with the plurality of light beams;~~

an imaging optical system for imaging the plurality of light beams deflected for scanning by a deflecting facet of the rotational polygon mirror on the surface to be scanned; and

synchronous detecting means for detecting the plurality of light beams deflected for scanning by the deflecting facet of the rotational polygon mirror so as to output a synchronous signal to determine a scanning start position of the plurality of light beams within an effective scanning range on the surface to be scanned in the main scanning direction,

wherein synchronous detection in which the synchronous detecting means detects the plurality of light beams is performed prior to that an image is recorded on the

surface to be scanned within the effective scanning range by the plurality of light beams,  
and

wherein the deflecting facet of the rotational polygon mirror has a width in a main scanning section in which a light beam last incident is eclipsed by an edge portion of the deflection facet if a light beam from a radiation point which is to radiate a light beam last incident on the deflecting facet of the rotational polygon mirror is ~~emitted~~ radiated prior to light beams from the other radiation points when the synchronous detection, and further a light beam from a radiation point which radiates a light beam first incident on the deflecting facet of the rotational polygon mirror is ~~emitted~~ radiated prior to light beams from the other radiation points out of the plurality of light beams emitted from the plurality of radiation points when the synchronous detection.

64. (Previously Presented) An image forming apparatus comprising:  
a multi-beam optical scanning apparatus according to claim 63;  
an image bearing member placed at said surface to be scanned;  
developing means for developing an electrostatic latent image formed on said image bearing member by the light beam with which the multi-beam optical scanning apparatus scans, as a toner image;  
transferring means for transferring a developed toner image onto a transferring material; and  
fixing means for fixing the transferred toner image on the transferring material.

65. (Previously Presented) An image forming apparatus comprising:  
a multi-beam optical scanning apparatus according to claim 63; and  
a printer controller for converting code data input from an external device  
into an image signal to input the image signal to the multi-beam optical scanning  
apparatus.

66. to 73. (Cancelled)